

CLAIMS:

1. A magnetic recording medium comprising:

On a non-magnetic substrate,

at least a soft magnetic undercoat film,

an orientation control film that controls the orientation of a film provided directly above,

a perpendicular magnetic film of which axis of easy magnetization is generally oriented perpendicular to said substrate,

and a protective film,

wherein the orientation control film is made of a Co alloy which contains one or more selected from Ti, V, Sr, Y, Nb, Mo, Hf, Ta, Ni and W.

2. The magnetic recording medium according to claim 1, wherein the Co content of the orientation control film is at least 20 at% and equal to or less than 85 at%.

3. The magnetic recording medium according to claim 1, wherein the orientation control film is made of a Co alloy containing W.

4. The magnetic recording medium according to claim 1, wherein saturation magnetization M_s of the orientation control film is equal to or less than 200 emu/cc.

5. The magnetic recording medium according to claim 1, wherein the thickness of the orientation control film is at least 0.5 nm and equal to or less than 20 nm.

6. The magnetic recording medium according to claim 1, wherein the orientation control film has an amorphous structure or a fine crystal structure.
7. The magnetic recording medium according to claim 1, wherein an intermediate film made of a material containing at least Co and Cr is provided between the orientation control film and the perpendicular magnetic film.
8. The magnetic recording medium according to claim 7, wherein the intermediate film is made of a CoCrPtB alloy.
9. The magnetic recording medium according to claim 7, wherein the thickness of the initial growth portion of the intermediate film having an amorphous structure is equal to or less than 1 nm.
10. The magnetic recording medium according to claim 1, wherein the perpendicular magnetic film is made of a material containing at least Co and Pt.
11. A method of manufacturing a magnetic recording medium, which comprises forming at least a soft magnetic undercoat layer, an orientation control film that controls the orientation of a film provided directly above, a perpendicular magnetic film of which axis of easy magnetization is generally oriented perpendicular to a non-magnetic substrate, and a protective film, on the non-magnetic substrate, wherein

the orientation control film is made of a Co alloy

which contains one or more elements selected from Ti, V, Sr, Y, Nb, Mo, Hf, Ta, Ni and W.

12. A magnetic read/write apparatus comprising a magnetic recording medium and a magnetic that reads and writes information on the magnetic recording medium, wherein

the magnetic head is a single pole type head, and

the magnetic recording medium comprises at least a soft magnetic undercoat film, an orientation control film that controls the orientation of a film provided directly above, a perpendicular magnetic film of which axis of easy magnetization is generally oriented perpendicular to a non-magnetic substrate, and a protective film, that are provided on the non-magnetic substrate, the orientation control film being made of a Co alloy which contains one or more elements selected from Ti, V, Sr, Y, Nb, Mo, Hf, Ta, Ni and W.